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ABSTRACT

This paper describes the Online Learning Academy (OLLA), a World Wide Web-based presence that supports the use of telecomputing in the classroom by: connecting teachers to each other and Internet educational resources; fostering the use of online resources and collaboration; encouraging and enabling the sharing of classroom experiences; and supporting and mentoring educators. Through a partnership among the application developers, educational technologists, curriculum specialists, and end users (teachers), the success of OLLA is based on the deployment of its three important components--appropriate content, continual professional development, and technology. The OLLA environment includes a personalized virtual classroom, "Kids Did This!" (collection of Web publications and student projects), resource center, mailing list, and personal journals. Units of study include selected and organized Web resources, presented around a theme. Initial results from pilot use with 20 elementary school teachers within the Department of Defense Educational Activity (DoDEA) schools during the 1996-1997 school year indicated OLLA's success. Teachers reported that OLLA: provided the means for communicating with other classrooms and teachers located at a distance; helped them to reach students who were difficult to reach using other approaches; is a great motivator for students and teachers alike; and is changing the way teachers think and teach. (AEF)

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The Online Learning Academy

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Abstract: This paper describes the Online Learning Academy (OLLA), a WWW-based presence which supports the use of telecomputing in the classroom. Initial results from pilot use with twenty elementary schools teachers within the Department of Defense Educational Activity (DoDEA) schools during the 1996-1997 school year are presented.

1. Introduction

The proliferation of computer technology and Internet connectivity in K-12 schools creates a wonderful opportunity to connect educators and students to each other and to real world learning experiences, investigations, and explorations. However, the WWW is also an unfriendly, impersonal and often haphazard environment. It has little knowledge about a user or specific goals, lacks consistent organization of resources, and has little quality control. Teachers who lack technical sophistication and have goals that do not translate well to WWW search queries are at a disadvantage. If unable to find the appropriate information, they are likely to abandon the resource—and miss the opportunity to enrich their student's learning experience through technology.

The Computer Aided Education and Training Initiative (CAETI) [CAETI 1997] under Defense Advanced Research Project Agency (DARPA) sponsorship supports the advancement of computer technology for effective education and training. The Department of Defense Educational Activity (DoDEA) K-12 schools in four school complexes in Europe were pilot sites for the educational initiative. DoDEA serves the DoD military and civilian dependents' educational needs from preschool through high school in the United States and overseas. The DoD Dependent Schools (DoDDS), the overseas component of DoDEA, are similar to U.S. school systems in terms of student population and demographics. However, DoDEA has one significant difference from the U.S. school systems -- the 172 DoDEA schools are geographically dispersed throughout fourteen countries.

The potential for DoDEA to use the WWW to meet its challenges is great. The Internet may be used effectively to support interaction among the DoDDS teachers and students as well as to access current information and to stay abreast of technology. However, simply putting computers in classrooms, wiring a school and providing an Internet connection is not sufficient. Effective use of this technology will occur when the teachers understand how to integrate it into everyday practice and *want* to use it. Acceptance of technology in the classroom will be achieved when it is both relevant to educational goals and comfortable to use.

Lockheed Martin, Educational Technologies and The Franklin Institute Science Museum have developed the Online Learning Academy (OLLA) [OLLA 1997a, OLLA 1997b] as part of the CAETI program. OLLA is a WWW environment which supports the effective use of telecomputing and the Internet in the classroom.

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by connecting teachers to each other and Internet educational resources,
by fostering the use of online resources and collaboration to enhance the classroom experience,
by encouraging and enabling the sharing of classroom experiences, and
by supporting and mentoring educators for all the above goals.

To engage the teachers, OLLA featured several online, thematic educational resources which provided the pilot teachers with many ideas on how to incorporate online resources into their classroom instruction. The remainder of this paper describes the Online Learning Academy and its use in the DoDEA testbed.

2. Deploying WWW Technology

Deploying WWW-based technology for effective use in the classroom requires a number of critical components. One is exploiting the client and distributed server architecture supported via the WWW. Technically, delivery of WWW content into the classroom is simple a web browser suffices. However, teachers and students rightfully need to view this interface as their portal into the wide open spaces of the Internet. As such, the WWW client is viewed more as their *virtual point of contact* or *launch point* onto the WWW than as a web browser. The importance of this observation is that the client needs to be an analogue of the place they are, namely their individual classroom and school. The more that the delivery mechanism is organized and tailored towards the school environment, the more effective and relevant the content delivered via the client will be.

The inherent distributed architecture of the WWW can be exploited in two key ways. First, for providing access to many rich and relevant educational sites, and, second, for providing a flexible and scaleable deployment into schools. General WWW resources are not typically well-constructed for educational use. For example, the need to support websites via advertising is a potential distraction to a teacher or a student. The delivery of educational resources needs to be mediated by providing server-based sites which function as well-founded and educationally relevant points of collaboration. Well-organized collections of topic-oriented general resources are also a mechanism for supporting educational use of WWW resources. The WWW as an infrastructure is inherently flexible as URLs can reference local or remote resources. The key is that the delivery to the teacher and the classroom is robust while the school infrastructure evolves, and, given the rapid and continual advance in network and computer technology, the ability to adapt the system over time is crucial.

3. The Online Learning Academy

OLLA is a virtual presence in the classroom which serves as a portal to the Internet. OLLA is a WWW Intranet environment which helps educators find relevant educational resources quickly, incorporate them easily into their daily classroom activities, and publish and share the results of these activities with others. Through a partnership among the application developers, the educational technologists, the curriculum specialists (in our case, science) and the end users (teachers), the success of OLLA project is based on the deployment of its three important components:

appropriate content - collections of organized educationally relevant resources, collaborative/targeted activities and user-contributed material,
continual professional development - a combination of on-site formal and informal sessions and continual online support, mentoring and presence, and
technology which supports these goals almost seamlessly quickly becoming natural to the user.

OLLA users find the graphical interface, which is organized with customized classrooms and a resource center, a familiar environment that is easy to use. As the teachers begin to integrate OLLA technology into their classrooms, they are starting to look differently at the way they teach. Both teachers and students find a great deal of information to supplement their textbooks, and consequently expand their knowledge base beyond what was possible in the past. OLLA also encourages users to become producers of Internet information

Figure 1: The OLLA classroom serves as a personalized interface to all OLLA resources, including current projects, journals and mailing lists.

instead of just consumers. By publishing students' work on the WWW, we believe OLLA could become a motivational tool for students as they discover their accomplishments will be viewed by other students.

4. A Brief OLLA Tour

As teachers enter OLLA, they are prompted for a personalized logon and password. OLLA uses this information to take the teacher to a personalized virtual *Classroom* (Figure 1), and to support pilot usage data collection. Once there, the teacher uses OLLA in a variety of ways. By clicking on the file cabinet, the teacher views original lesson plans, complete with teacher-selected Internet links. There are also activities and additional plans written by other teachers which may offer new ideas to implement in their classrooms. Featured activities and units of study (Section 0) are displayed on a white board at the front of the classroom for quick and easy access to those resources. OLLA also provides a separate classroom interface for students which is shared by all students in the same class. The student classroom provides easy access to the *Kids Did This!* gallery and current projects. *Kids Did This!* is an organized collection of WWW publications and a favorite spot for viewing other students' work.

From the classroom, a teacher may click on the door which opens directly to the *Resource Center*. In the Resource Center, the teacher finds a wide array of Internet resources and teacher activities which have been organized by subject area. Teachers may go directly to the topic of interest, or query the Resource Center to find the relevant information they seek. Available from the Resource Center and the Classroom are links to current publications such as newspapers and periodicals, which allow teachers to bring up-to-date information into the classroom. Reference resources, such as an online dictionary, thesaurus, maps, World Fact Book, and Bartlett's Book of Quotations are only a click away. Using the mouse, teachers easily access several Internet search tools which allow them to find additional resources to supplement interests and activities.

Other valuable features of OLLA include the teachers' *mailing list* and *personal journals*. The mailing list allows teachers to communicate with other OLLA teachers. Teachers are encouraged to use this mailing list to share information and ideas and to solicit collaboration in classroom projects and activities. Journals are provided so teachers may write reflections and thoughts about classroom projects. While the journals are personal writings, they may be read by any OLLA teacher who wishes to learn from others' experiences with similar projects or studies. In addition, a *Problems* mailing list is linked to the headers and footers of every page so that technical problems can be quickly reported, tracked and addressed.

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The world we live in is populated by millions of plants and animals. Yet, each one is an individual.

Individual plants and animals are grouped together in families, according to their physical structure and their behavior.

Families of living things interact with each other and with their neighborhood.

All living things have a circle of life. Birth, growth, reproduction, and death are natural parts of the natural world.

Figure 2: The *"Living Things"* unit includes selected and organized web resources, presented around the theme of ecosystems.

Each teacher creates a profile page where personal information, pictures and contact information are posted. These pages are located in the *Members List* and are a wonderful way for teachers to locate colleagues in different schools who teach the same grade levels or content. Teachers have also found this a useful place to link classroom pages, which often contain student portfolios. The *Passport* matchmaker system, an interface to a searchable database of educators, connects the DoDEA teachers with other (non-OLLA) stateside teachers through active searches on user profiles.

Two forms of search are available, depending where you are in OLLA. Through the headers and footers on nearly every page is a general search facility. On certain designated pages (such as *Help* and the *Resource Center*) localized searching can be triggered to seek information from pages associated with a particular topic or area.

5. Online Units of Study

There is no shortage of educational resources on the WWW. However, teachers may lack the time and skill to locate and evaluate them. OLLA units of study, like *"Living Things"* [TFI 1996] and *"Wind: Our Fierce Friend,"* [TFI 1997] include selected and organized web resources, presented around a theme. For example, in *"Living Things,"* (Figure 2) the theme of ecosystems is considered. Links to existing web resources are strategically placed within newly created content that facilitates hands-on classroom investigation of the theme. Plans for growing seeds in the classroom are complemented with links to online plant resources. Tips for raising fruit fly colonies are supported with links to fruit fly physiology resources.

OLLA thematic units enable teachers who may be novice technology users to incorporate online resources into their classroom instruction. At the same time, the units encourage approaches to hands-on classroom investigations. The availability of, and access to, organized online units of study may have a significant impact on the acceptance of new technology by veteran teachers. OLLA offers them easy access to instructional resources, convenient tools for communication with the online educational community, and rich opportunities and ideas for collaborating with schools around the world. Easy, convenient, and rich may be significant adjectives as teachers begin to articulate their future desires for technology in their classrooms.

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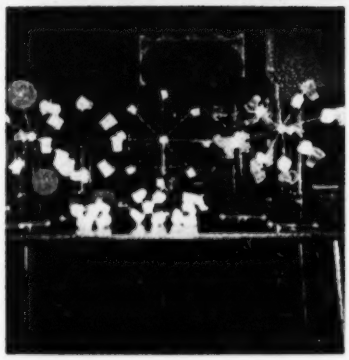
6. OLLA Use in Pilot Project

OLLA was in pilot use during the 1996-1997 school year with about twenty elementary school teachers. The participating DoDDS school complexes include three sites in Germany and one in Italy. Initial use in fall 1996 included eight pilot teachers from the 2nd and 5th grades. In the spring of 1997, twelve 3rd and 4th grade teachers joined the project. The core OLLA components consist of a set of HTML content pages and Common Gateway Interface (CGI) programs which are accessible to the user via an HTTP server. The search component uses the Harvest indexing and retrieval engine [Harvey, Schwartz and Wessels 1994].

The Franklin Institute Science Museum facilitates and encourages hands-on, collaborative science instruction. Museum-developed units of study emphasize inquiry-based teaching and learning (Section 0). So far, OLLA has featured two such units: *"Wind: Our Fierce Friend"* and *"Living Things."* In both, the unit of study offers connections to online information, areas for communication, potential for collaboration, and places to share student and teacher work. There are deliberate differences between the two, however. *"Wind"* is based upon all classrooms receiving the same hands-on materials so that students undertook common activities and then used the online unit to communicate and share their results and experiences. In *"Living Things,"* teachers and students use their own existing classroom materials, such that students undertake completely different classroom activities. The online unit is the common element and a bridge for sharing their diverse perspectives on the theme. Additionally, *"Living Things"* offers a more overt connection between classroom activities, national standards and curricular themes, while *"Wind"* is directed toward completely open-ended investigation.

Professional development and support for the teachers participating in the OLLA project consists of on-site formal staff development sessions, informal follow-up visits to classrooms, accessible online documentation and help, and continual mentoring and assistance via e-mail. Formal staff development included the basic use of OLLA, instruction for some general technical skills and assistance in preparing a technology plan to



THE WIND

Wind can cause tornadoes. Wind can be strong and weak. My brother thinks the wind is a person. I know it is not. Wind can cause total destruction.

Figure 3: A variety of creations result from participation in the thematic activities.

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integrate OLLA and the featured thematic units into classroom instruction. The teachers have progressed significantly in their understanding of technology and its relevance to their classroom goals. The classroom portfolios based on both units include poetry, prose, drawings and photographs of activities such as building pinwheels, constructing windmills and taking nature walks (Figure 3).

7. Conclusions and Future Work

The WWW OLLA implementation is readily scaleable in terms of number of teachers, adding new schools, classrooms and content. Our goal is to further enable teacher independence by coaching teachers into the role of mentors for newer participants, as the OLLA project continues to grow. Many of the pilot teachers have begun take a more proactive role as they become more comfortable with the technology.

Within the CAETI program, each pilot project fielded in a school underwent a formal evaluation. Initial results from OLLA use during the 1996-1997 school year indicate initial success. During the evaluation surveys, the teachers reported that:

- OLLA provided the means for communicating with other classrooms and teachers located at a distance.
- OLLA helped them to reach students who were difficult to reach using other approaches.
- OLLA is a great motivator for students and teachers alike.
- OLLA is changing the way teachers think and teach as a result of seeing other possibilities.

Technology adoption by teachers is extremely difficult if it is imposed and is not relevant to what the teacher needs and does in the classroom. After fall pilot useage, over 80% of the teachers in OLLA classrooms indicated they would use OLLA next year if it is available; the remaining 20% would probably use it—well above the normal 30 to 40% acceptance rate in the literature. OLLA's adoption indicators suggest the deployment and supported use of highly targeted and relevant technology via educational technology specialists is a highly effective model. Perhaps it can break through the technology adoption rate barrier in schools.

In addition, we have a companion research and development effort [Pastor, Taylor, McKay and McEntire, 1997] which complements our goals of enabling appropriate, timely, customized access to Internet resources through a set of intelligent resource agents which perform a variety of tasks related to supporting and enhancing the use of the Internet as an educational tool. The resulting system is accessible from within a WWW infrastructure and was successfully integrated with OLLA. Aspects of this technology will enhance OLLA as the project matures.

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